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### 781-6 Do Patients With Previous CABG Have Worse Outcomes With Thrombolytic Therapy?

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Limited data are available on the outcome of patients (pts) with previous CABG treated with thrombolytic therapy (TT), since these pts have been excluded from most randomized clinical trials. TIMI 9B was a randomized trial comparing hirudin vs. heparin in conjunction with TT in 2993 pts with acute myocardial infarction (MI). We reviewed the characteristics and outcomes of 107 pts (4%) with previous CABG. Compared to pts without previous CABG, they were older, more likely to have hypertension, hyperlipidemia, peripheral and cerebral vascular disease, but less often current smokers. They also were more likely to have had previous MI (65% vs. 14%*), angina (67% vs. 29%*), and PTCA (31% vs. 5%*). At time of enrollment, a greater proportion were receiving aspirin (73% vs. 22%*), beta-blockers (37% vs. 13%*), ACE inhibitors (20% vs. 7%*), and nitrates (32% vs. 15%*). There was no difference between groups in the number of pts receiving cardiac catheterization, PTCA, or CABG. By 30 days, pts with previous CABG had significantly higher rates of cardiogenic shock and recurrent MI and tended to have higher mortality. However, in a multivariate analysis previous CABG was not an independent risk factor for death or MI.

| | n | Shock | MI (30 day) | Death (30 day) |
|---|---|---|---|---|
| Previous CABG | 107 | 11%* | 16.2%† | 8.5% |
| No CABG | 2886 | 4% | 10.3% | 5.8% |

*$p < 0.001$, †$p < 0.05$

*Conclusion:* Patients with previous CABG treated with TT constitute a high risk group with a higher rate of adverse outcomes. While clinical outcomes are worse, previous CABG is not an independent risk factor for death or MI. While these pts had a higher incidence of adverse risk factors, they were also more likely to be on cardioprotective medications (aspirin, beta-blockers, ACE inhibitors) prior to treatment.

## 782 Stents: Does High Pressure Deployment Increase Restenosis?

Wednesday, March 19, 1997, 10:30 a.m.–Noon
Anaheim Hilton and Towers, Pacific D

10:30

### 782-1 Does High-Pressure Stent Expansion Induce More Restenosis?

T. Akiyama, C. Di Mario, B. Reimers, M. Ferraro, I. Moussa, S. Blengino, A. Colombo. *Columbus Clinic, Milan, Italy*

High-pressure stent dilatation has virtually eliminated the risk of subacute stent thrombosis but it can increase wall damage and has been associated with a higher risk of late restenosis in recent reports. To test this hypothesis, all the 1181 lesions successfully treated with stent implantation receiving a final ultrasound examination, were divided based on the maximal inflation pressure of the largest balloon (≤ 16 ATM and >16 ATM). The "low"-pressure group included 692 lesions (58.6%) and the high-pressure group 489 lesions (41.4%). The Table below shows the percent diameter stenosis (DS) and restenosis rate (>50% DS) in the two groups, distinguishing in the high-pressure group the subsets with optimal or suboptimal stent expansion (in-stent minimal cross-sectional area ≥60% of the nominal balloon area):

| | ≤ 16 ATM | >16 ATM Stent CSA | | |
|---|---|---|---|---|
| | | Suboptimal | Optimal | |
| Balloon Diameter (mm) | 3.61 ± 0.58 | 3.73 ± 0.39 | 3.46 ± 0.42 | # |
| Max. Pressure (ATM) | 13.7 ± 2.3 | 18.8 ± 1.5 | 18.5 ± 1.2 | † |
| Angio in-stent MLD (mm) | 3.16 ± 0.60 | 2.96 ± 0.50 | 3.11 ± 0.47 | * |
| Final Angio % stenosis | −2.9± 10.5 | 1.4 ± 14.7 | −1.3± 12.4 | * |
| ICUS in-stent MLD (mm) | 2.9 ± 0.6 | 2.4 ± 0.3 | 2.9 ± 0.4 | # |
| ICUS in-stent CSA ($mm^2$) | 8.04 ± 2.95 | 5.71 ± 1.33 | 7.60 ± 1.88 | # |
| F-Up Angio % DS | 26.4 ± 28.9 | 41.6 ± 36.9 | 28.7 ± 26.9 | ‡ |
| F-Up Restenosis (≥50% DS) | 19.5% | 45.3% | 21.1% | ‡ |

#$p < 0.05$ (≤ 16 vs Suboptimal vs Optimal), *$p < 0.05$ (≤ 16 vs Suboptimal), †$p < 0.05$ (≤ 16 vs >16), ‡$p < 0.05$ (≤ 16 and Optimal vs Suboptimal)

In conclusion, this retrospective analysis suggests that the restenosis rate after stenting is not affected by high-pressure stent expansion. A higher incidence of restenosis was observed only when the final stent dilatation was suboptimal despite high-pressure inflation.

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### 782-2 Does the Use of Aggressive Stent Dilatation Lead to More Late Loss and Restenosis?

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Stent expansion with high-pressure inflations has recently become standard. Does aggressive stent dilatation encourage more intimal proliferation, leading to increased late loss and restenosis, or does the achievement of a larger lumen lead to less restenosis?

Angiographic and clinical results were compared in 728 stented vessels divided into 3 consecutive groups: A: Traditional techniques, B: Oversized balloons and C: High pressure inflations. Routine angiographic follow-up was performed in 80% at 4 to 6 months.

| | Group A | Group B | Group C | p |
|---|---|---|---|---|
| N | 233 | 178 | 317 | |
| Balloon/artery | 1.15 ± 0.16 | 1.26 ± 0.20 | 1.16 ± 0.18 | < 0.001 |
| Max Atm | 9.0 ± 1.9 | 12.4 ± 3.7 | 14.7 ± 6.5 | < 0.001 |
| Ref lum (mm) | 3.2 ± 0.5 | 3.2 ± 0.6 | 3.1 ± 0.4 | ns |
| Length (mm) | 10.6 ± 7.5 | 10.0 ± 6.5 | 13.1 ± 8.6 | < 0.001 |
| MLD-pre (mm) | 0.8 ± 0.5 | 0.9 ± 0.5 | 0.8 ± 0.5 | ns |
| Final MLD (mm) | 2.9 ± 0.5 | 3.3 ± 0.8 | 3.1 ± 0.5 | < 0.001 |
| FU MLD (mm) | 1.9 ± 0.9 | 2.4 ± 0.8 | 2.1 ± 0.9 | < 0.001 |
| Acute gain (mm) | 2.1 ± 0.7 | 2.5 ± 0.9 | 2.3 ± 0.6 | < 0.001 |
| Late loss (mm) | 1.0 ± 0.9 | 1.0 ± 0.8 | 1.1 ± 0.8 | ns |
| Complications | 11% | 13% | 5% | < 0.01 |
| Angio restenosis | 32% | 15% | 24% | < 0.01 |
| Clin restenosis | 26% | 18% | 20% | < 0.01 |

*Conclusions:* Baseline dimensions were similar for the 3 groups except for longer lesions in group 3. Aggressive stent expansion did not increase late loss, but was associated with a lower rate of restenosis.

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### 782-3 The Dark Side of High Pressure Stent Deployment

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High pressure dilatations have been shown to enhance the expanded geometry of coronary stents and thus lessen the risk of thrombotic closure. However, the longer term effects of high pressure inflations on vascular healing and neointimal proliferation remain unknown. The SAphenous VEin De Novo (SAVED) Trial was conducted from January 1993 to June 1995, a period during which the use of high pressure stent deployment evolved into routine clinical practice; use of high pressure inflations (≥16 atm) significantly increased during the later stages of the trial ($p < 0.001$). In this substudy analysis, we compared the 6 month angiographic results of stented vein graft lesions treated with high (≥16 atm) and lower (≤ 15 atm) pressure deployment. Of 105 patients treated with Palmaz-Schatz stents, angiographic follow-up at 6 months was performed in 90% of eligible patients. Quantitative coronary angiographic results (mean values in mm) were as follows:

| Pressure | Lesion (n) | Ref Dia | Length | Pre-mld | Post-mld | 6 mo mld |
|---|---|---|---|---|---|---|
| Low | 88 | 3.23 | 10.0 | 0.95 | 2.86 | 1.91 |
| High | 31 | 3.03 | 8.9 | 0.80 | 2.82 | 1.26 |
| p | – | ns | ns | ns | ns | <0.01 |

Therefore, stented lesions treated with high pressure inflations demonstrated significantly smaller minimal luminal diameter at 6 months than lesions treated with lower pressure inflations. The suboptimal 6 month outcome with high pressure inflations was due to the significantly greater late loss in this group (1.47 versus 0.91 mm, $p < 0.01$). These results strongly suggest that the deployment of stents with ≥16 atm distending pressure has a deleterious effect on late lumen loss and 6 month angiographic outcome in vein grafts, presumably due to increased neointimal proliferation within the stent.